

Chaps. vi.-x. deal with geometrical and sheet-building spiders, their work and habits. The miscellaneous contents of chap. x. include "water-boatmen" and "mentality of fishes," as well as the habits of wasps and bees. Interesting observations on mimicry in butterflies—chap. xi.—include *Kallima inachus* and a *Melanitis*, which, like Kal-

attention in chap. xii. Few will agree that the male glow-worm is "not even capable of perceiving a light" given out by the female; and on the pages where the massacre of a flight of winged termites is described there is much repetition of the names of various birds taking part in the orgy. We do not like the somewhat Teutonic view that in Nature "all is war and carnage, greed and cruelty." Animals, including man, must destroy life for food, and no doubt there is even unnecessary killing by some of the carnivora; but, on the whole, Nature is fairly peaceful, and among many orders the unfit are removed in honourable battles between males, while bloodless competition by dance or song governs selection in others.

Among the observations of mammals, that concerning the flying squirrel is very interesting, and the author gives us a beautiful picture—here reproduced (Fig. 2)—of *Petaurista inornata*. The only comment necessary is upon the statement (p. 243) that "the tail of a bird cannot be used as a rudder." Most readers will take the opposite view. Chap. xiv. contains the best account of soaring we have ever read, and the explanation will be welcomed by many who may not be able to observe the phenomenon for themselves. The book ends with a sketch of the geology of the Himalaya based on the work done by the Geological Survey of India. The author acknowledges his indebtedness to the labours of Mr. C. S. Middlemiss.



FIG. 2.—The Flying Squirrel (*Petaurista inornata*). From "A Naturalist in Himalaya."

lima, resembles dry leaves blown by the wind; and these are compared with *Dophla patala*, which, "coloured a rich green," blends with the fresh foliage; "the *Dophla* alights where it is lost upon the branches, the *Melanitis* seeks concealment on the leaf-strewn ground; the *Dophla* rests with wide-open wings . . . *Melanitis* with wings tightly closed." Glow-worms, termites, and shells receive

ing we have ever read, and the explanation will be welcomed by many who may not be able to observe the phenomenon for themselves. The book ends with a sketch of the geology of the Himalaya based on the work done by the Geological Survey of India. The author acknowledges his indebtedness to the labours of Mr. C. S. Middlemiss.

The Annular Eclipse of April 8.

By DR. A. C. D. CROMMELIN.

FINE weather in most parts of the country favoured observation of this phenomenon. Great public interest was taken in the search for stars. Venus was seen with ease nearly everywhere, Mercury was also undoubtedly observed, and Vega was suspected at Oxford, though not seen by Mr. Mitchell at Mallaig, which is inside the zone of annularity. The lowering of temperature was marked, amounting to as much as 9° F. The diminution of light was striking, probably more so than if the sky had been partially covered with cumulus clouds. The light had the purplish hue that so often prevails in large eclipses; it doubtless arises from the absorption of the solar atmosphere, which is more noticeable in the region near the limb. Successful spectroscopic observations of the reversing layer and chromosphere were made by Profs. Fowler, Newall, and Sampson at

Kensington, Cambridge, and Edinburgh respectively.

At Greenwich efforts were made to improve the determination of contact times by Mr. Innes's method of making a number of rapid measures of the distance between the cusps near the beginning and end of the eclipse. The measures are not yet fully reduced, but it is probable that each contact will be determined within 2 sec. by the combined results.

It can already be stated that the Hansen-Newcomb right ascension of the moon needs to be corrected by about +0.80 sec., which is just double the correction that was applied in the Nautical Almanac eclipse elements. Several photographs were taken near the beginning and end of the eclipse, also near the greatest phase. One of the last, exposed at 8h. 48m. 2s., Greenwich mean

time, is reproduced by kind permission of the Astronomer Royal. The second exposure on the plate was made in order to render a greater length of the reference wires visible; it was found very difficult to orientate the plates of the 1912 eclipse,

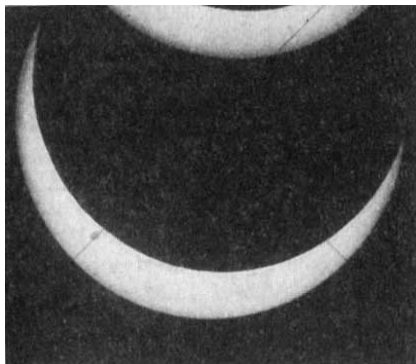


FIG. 1.—Partial solar eclipse one minute after greatest phase. Reproduced by permission of the Astronomer Royal.

owing to the small amount of the wires that was registered.

It is curious that the writers of many of the popular accounts of the eclipse speak of it as the only large eclipse visible in London in the last forty years, in forgetfulness of the still larger eclipse of 1912, for which also the weather conditions were favourable.

MR. ELBORN, one of the assistants in the Botany School at Cambridge, has made some interesting observations on the behaviour of leaves during the eclipse on April 8.

It is well known that the stomata (which are minute apertures in the leaves) are open in daylight and shut in darkness. These facts are demonstrable by means of a little instrument called the Horn hygroscope described in my paper "Observations on Stomata" (Phil. Trans., B, vol. cxc., 1898, pp. 531-621). It will be seen that as the eclipse came on the readings fell from 3.5 at 8.40 a.m. to 1.5 at 9.38—that is, the stomata closed considerably—and by 11.45 a.m. they had returned to their original condition, as shown by the reading of the hygroscope, viz. 3.4.

The plant used for the experiment was the common *Tropæolum*; the behaviour of its leaves is shown in the following table, the second column giving the readings of the Horn hygroscope:

A.M.		A.M.	
8.40	3.5	9.50	1.5
9. 5	3.2	10. 4	1.7
9.19	2.4	10.20	2.0
9.21	2.3	10.34	2.8
9.27	1.9	11. 1	3.0
9.32	1.7	11.45	3.4
9.38	1.5		

FRANCIS DARWIN.

Brookthorpe, Gloucester, April 11.

THE partial annular eclipse of the sun was well seen in a clear sky in Herefordshire (N. lat. $51^{\circ} 56'$, W. long. $2^{\circ} 38'$). The darkening of the landscape was marked, and the sky in the north assumed a dark purplish-blue colour. It was not dark enough to show any planets or stars even with field-glasses. Birds continued to feed and hop about as usual.

The most remarkable effect observed during the darkest phase was on the sky surrounding the sun. The atmosphere was slightly hazy from the east wind, and on the sky, from the sun as a centre, was projected a radiating series of narrow light and dark rays visible for quite 20° from the sun. It was a pretty phenomenon, and one which I had not observed before.

ELEONORA ARMITAGE.

Dadnor, Herefordshire, April 8.

DURING the maximum phase of the eclipse on April 8 the shadows thrown by trees on a footpath had a strange appearance, the details of boughs and twigs being broken up more or less completely into parallel crescents. At first sight the appearance suggested a modification of the dappled effect of sunlight falling through trees in summer; but the shadows of bare twigs were broken up in the same way, and such scanty foliage as the trees bore was far too thin to give rise to ordinary pin-hole images. Moreover, quite detached shadows were affected. The shadow of a narrow window-bar thrown on a floor was tagged out at each side so as to look like the shadow of a ragged feather from a pheasant's tail.

E. LEONARD GILL.

Hancock Museum, Newcastle-upon-Tyne,
April 9.

Obituary.

PROF. S. W. BURNHAM.

PROF. S. W. BURNHAM, whose death is announced, was born on December 12, 1838, at Thatford, Vermont, U.S.A. His early profession was that of journalist and stenographer at Chicago. Burnham was, however, soon filled with a zeal for astronomical research, in particular double-star observation, in which department he was one of the greatest and most successful workers of all time. In 1870 he became the possessor of an excellent 6-in. refractor by Alvan Clark. In spite of his arduous professional work, he observed with this instrument nightly "till daylight drove him to bed." He discovered 451 pairs with it, nearly all difficult, and some of special interest, being faint, close companions of naked-eye stars (for example, ν Scorpii, mags. 4 and 8, NO. 2685, VOL. 107]

dist. 0.3"). Burnham had a marvellously acute eye, some of the pairs discovered with the 6-in. taxing the powers of the largest telescopes to separate. His next work was done with the 18½-in. refractor of the Dearborn Observatory, Chicago, from 1877 to 1879; with this he discovered 413 pairs, many of which are recorded in vol. xliv. of *Memoirs of the Royal Astronomical Society*.

Burnham was selected in 1879, on Prof. Newcomb's recommendation, as Prof. Holden's colleague for testing the atmospheric conditions at Mount Hamilton preparatory to the founding of the Lick Observatory. He remained there to observe the transit of Mercury in 1881, and was afterwards on the staff of the Lick Observatory, making still further discoveries and observations,